

FIRST RECORD OF *Richardsonianus australis* (BOSISTO, 1859)  
(HIRUDINEA: RICHARDSONIANIDAE) TAKING A BLOOD  
MEAL FROM A FISH

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**ABSTRACT:** *Richardsonianus australis* (Bosisto) is recorded for the first time taking a blood meal from a fish. Leeches were found on three of 130 *Galaxias olidus* Günther (Family Galaxiidae) taken in a small, steep tributary of the Seven Creeks river system, Victoria. Twenty-two fish in the sample had characteristic leech scars; 16 had single scars, 3 had two scars and 3 had three scars. Most of the scars were on the upper surface of the body and in front of the pelvic fins insertion. The length to caudal fork of scarred fish varied from 51 to 95 mm, that of unscarred fish from 24 to 87 mm. The sex ratios for scarred and unscarred fish did not differ significantly ( $P > 0.1$ ) from 1:1. The probable mechanism of attachment of the leeches to the galaxiids is discussed.

INTRODUCTION

*Richardsonianus australis* was first described by Bosisto in 1859 (Bosisto 1859), but since then very little information has been published on its biology. It was originally described as *Hirudo australis* and was subsequently renamed *Limnobdella australis* before being placed in *Richardsonianus*. The history of its taxonomy is to be found in Soós (1968) and Richardson (1968, 1969). It is an essentially aquatic leech which has been recorded feeding on the blood of humans and other mammals (Pope 1965) and is known to feed on turtles and frogs (Richardson, pers. comm.). This note presents details of the finding of *R. australis* parasitising a scale-less freshwater fish, *Galaxias olidus* Günther

(Family Galaxiidae), and is the first record of *R. australis* taking blood meals from fish.

COLLECTION OF THE MATERIAL

A survey of the fish fauna of the Seven Creeks river system, Victoria, was undertaken during the summer of 1975-76, when fish were collected at 60 sampling stations throughout the system, from headwater tributaries to near the point where the main Seven Creeks channel enters the Goulburn River. At one of the sampling stations (1:100 000 Topographic Survey, Sheet 8024, Series R652, Map Reference CV841207) leeches, subsequently identified as *R. australis*, were found attached to three individual *G. olidus*, one leech being attached



PLATE 27  
*Galaxias olidus* (LCF 91 mm) with two leech scars.

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to each galaxiid. Many other galaxiids in the sample had Y-shaped scars (Pl. 27) typical of the incisions made by 3-jawed sanguivorous leeches. No other fish species were recorded at this sampling station. *Galaxias olidus* was recorded at 21 other stations, at 12 of which it was the only fish species recorded, but no leeches or leech scars were found on these galaxiids or on any of the other fish species taken in the Seven Creeks survey (Table 1). A detailed report of the Seven Creeks survey will be published at a later date.

The sampling station in question was on a small (mean width 1 m, mean depth 0.4 m) steep-gradient (50 m/km) tributary at an altitude of 540 m. The substrate was composed of sand, and debris, mainly fallen branches, was abundant on the stream bed. *Callitriche* and *Veronica* were the predominant aquatic plants in the sampling area, and the stream was well shaded by eucalypts, wattles and overhanging fern-covered banks.

The fish sample was taken by means of rotenone poisoning between 1020 and 1115 h on 16 December 1975. A stop net was set across the stream and rotenone (together with fluorescein to indicate its spread) was added to the water about 120 m upstream. Potassium permanganate was added to the stream at the stop net to neutralise the effect of the poison. Fish were collected at the stop net and throughout the poisoned stretch of stream by means of small-mesh (>1.05 mm) dip nets. The three leeches attached to the fish became detached when the fish were removed from the water.

TABLE 1  
FISH SPECIES RECORDED IN THE SUMMER  
1975-76 SURVEY OF THE SEVEN CREEKS RIVER  
SYSTEM.

Family	Species
Percichthyidae	<i>Maccullochella maquariensis</i> (Cuvier and Valenciennes) <i>Macquaria australasica</i> Cuvier and Valenciennes <i>Plectroplites ambiguus</i> (Richardson)
Teraponidae	<i>Bidyanus bidyanus</i> (Mitchell)
Kuhliidae	<i>Nannoperca australis</i> Günther
Gadopsidae	<i>Gadopsis marmoratus</i> Richardson
Galaxiidae	<i>Galaxias olidus</i> Günther
Retropinnidae	<i>Retropinna semoni</i> (Weber)
Gobiidae	<i>Hypseleotris klunzingeri</i> (Ogilby)
Salmonidae	<i>Salmo trutta</i> Linnaeus
Percidae	<i>Perca fluviatilis</i> Linnaeus
Cyprinidae	<i>Cyprinus carpio</i> Linnaeus <i>Carassius auratus</i> (Linnaeus)
Poeciliidae	<i>Gambusia affinis</i> (Baird and Girard)

## THE MATERIAL

Of 130 *G. olidus* collected, 22 had characteristic leech scars; 16 fish had single scars, 3 had two scars and 3 had three scars (Fig. 1). Of the 31 scars, 15 were on the dorsal surface, 8 on the dorso-lateral surface, 4 on the ventro-lateral surface and 4 on the ventral surface; 23 scars were in front of the pelvic fins insertion and 8 were behind the pelvic fins insertion. The LCF (length to caudal fork) of scarred fish varied from 51 to 95 mm (mean 67 mm), whereas that of unscarred fish varied from 24 to 87 mm (mean 61 mm). The sex ratios for scarred and unscarred fish did not differ significantly from 1:1 (Table 2); the sex of each fish was determined by microscopic examination of the gonads.

## DISCUSSION

*Richardsonianus australis* is not common in fast-flowing waters where the substrate is composed of gravel or boulders, but in waters with a substrate of sand or mud and with plenty of shelter, such as fallen branches, densities may reach one leech/10m<sup>2</sup> of substrate (Richardson, pers. comm.). Conditions conducive to high leech densities occurred at the Seven Creeks station where the leech-scarred galaxiids were found. In addition, the station was situated above a pool which would probably serve as a refuge for both leeches and galaxiids during dry periods. Although similar conditions occurred at other Seven Creeks stations where galaxiids and other fish species occurred no leech-scarred fish were found at these stations.

Many leeches live as ectoparasites on fish (Meyer 1940, 1946a, 1949, 1965) and may even reach epidemic proportions (Meyer 1946b). Brook trout, *Salvelinus fontinalis* (Mitchell) have been killed as the result of attacks by hordes of the freshwater leeches *Macrobdella decora* (Say) and *Haemopsis grandis* (Verrill) (Rupp and Meyer 1954). *Richardsonianus australis* is a competent swimmer and actively seeks its hosts (Richardson, pers. comm.). It is likely that it attaches itself to *Galaxias olidus* in a manner similar to that

TABLE 2  
SEX RATIOS OF *Galaxias olidus* TAKEN IN THE  
PRESENT STUDY

	Males	Females	$\chi^2$ (d.f. = 1)	Significance
Unscarred	48	60	1.3333	P > 0.1
Scarred	14	8	1.6364	P > 0.1
Total	62	68	0.2769	P > 0.5

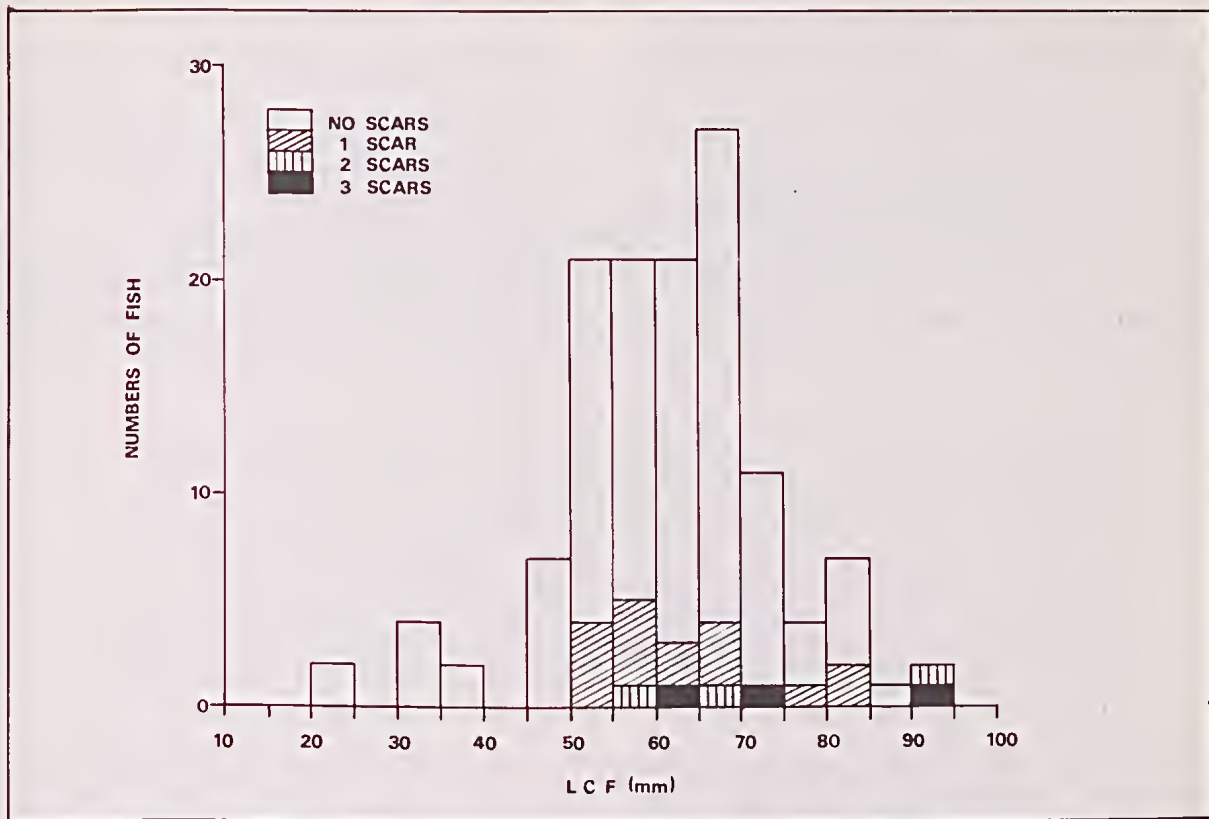


FIG. 1 — Length frequency distribution of *Galaxias olidus*, showing the numbers of fish of different lengths having no scars, one scar, two scars and three scars.

employed by *Kaiyabdella dawbini* (Richardson). This leech actively seeks its host *Goddardobdella elegans* (Grube), another leech, swimming to it and attaching rapidly and securely to it by the anterior sucker. This is done while both are swimming (Richardson 1972). This method of attachment is in contrast to that of *Calliobdella nodulifera* (Malm), which is incapable of swimming. This marine leech attaches itself by the posterior sucker to some suitable object and, extending itself, sways to and fro. With the anterior sucker it strikes and fixes upon a passing fish with remarkable speed and, releasing its hold posteriorly, is carried off attached to its host (Leigh-Sharpe 1917, quoted by Meyer 1946b).

In *G. olidus* the majority of the scars were on the upper surface of the body and anterior to the pelvic fins insertion. Such positioning would make it difficult for the fish to displace the leech by rubbing against the bottom or debris, etc., the method which fish commonly use to clear away objects attached to the body.

Attacks by *R. australis* on fish must be considered exceptional since of the 14 species of fish

recorded at the 60 Seven Creeks sampling stations only one species, *G. olidus*, was attacked and then only at one station, although this particular species also occurred at 21 other stations.

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